A Regression Study of the Effect of Non-Metropolitan School Funding Graduation Rates in Ohio

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Abstract

The education that students in Ohio's metropolitan areas receive is often perceived as being sub-par because of below-average funding. Rural areas, however, are often overlooked in funding studies because data are hard to obtain or subjects are too widespread. However, approximately 20 percent of the nation's population lives in rural areas, and I wanted to find how the state funding for those counties in Ohio affects their graduation rate. As I gathered data, a second question arose. It was impossible to look only at one factor in determining the graduation rate, so I began to study the correlation between standardized test scores (such as the OGT) and the graduation rate.

I first conducted a literature review to better understand the problem at hand. Rural school graduation rates reflect a lot of factors, and I couldn't include all of these factors in a regression equation; however, in researching the outside factors, I was able to gain a more comprehensive knowledge of how one hard-to-measure variable affects another.

I then took an assessment of all public schools in Ohio using the Ohio Government Education website and selected all counties which are designated non-metropolitan. From there, I eliminated schools without adequate information, including all schools which contained any grade other than 9-12, and those who were grade 9-12 but did not give data on each area that I was studying. Finally, for counties with more than five qualifying schools I randomly chose five so that the sample size wasn't skewed by choice of area. The reason for the selection of five schools or less per county refers back to my literature review- I knew that some rural counties are much more wealthy than others or are in closer proximity to resources that can influence graduation rate, and although these variables weren't measureable I wanted to minimize their effect.

As a result of completing the regression, I found that many of my variables were not statistically significant, meaning that their values could have come about by chance according to my chosen parameter. For instance, I set out to measure the effect that governmental school funding had on graduation rate, assuming it to be positive. However, I found that the parameter estimate was very small (school funding had a negligible effect on graduation rate) and that in fact, this result was statistically insignificant. As I progressed in my research, I also became interested in the Ohio Graduation Test (OGT) results and their effect on graduation rate. My results suggest that the effect of the OGT results on graduation rate is marginal, at best, and perhaps zero at worst.

I also found that correlation between the variables was low, meaning that there was not a problem with multicollinearity, which would have made it difficult to tell which was truly having an effect on the dependent variable.

The larger implications of my findings is that further studies should be conducted as to whether or not the OGTs are achieving the desired results. My regression equation did have a lot of variables and when I considered what I was testing, I saw that there were a lot of variables and thus ways in which I could come to a wrong conclusion. Because of this, I cannot strongly state that the OGT results are all correct, but there does seem to be a need for further research. In addition, additional tests could be conducted which look only at the school funding and its correlation with graduation rate, but which include more sources of funding, such as the aggregated local and state funds.

The fact that the variables are not highly correlated is good, and could lead to further research and more highly refined regressions. For instance, more regression runs could be conducted in which a variables were brought in one at a time, and thus see more clearly the effects of the

individual independent variables. In addition, I could also calculate the direct correlation between the dependent and independent variables by performing correlation using Excel.

Introduction

Background and Statement of the Problem

A metropolitan area is, by definition, a large population center consisting of at least one municipality with a population of 50,000 inhabitants or more in a given county, and sometimes one or more surrounding counties. Ohio is one of the states with the highest number of metropolitan areas, with 16 in total. Three- Cincinnati, Cleveland, and Columbus- are all among the top 40 major metropolitan areas in the United States.

The education that students in Ohio's metropolitan areas receive is often perceived as being sub-par because of below-average funding, and many studies have been conducted to try and verify this belief. Rural areas, however, are often overlooked in funding studies because data are hard to obtain or subjects are too widespread. However, approximately 25 percent of the nation's population lives in rural areas, and while a growing number of these are senior citizens, eight million are between the ages of 15 and 24 years of age. (McFarland, 1) The demographic group is massive and warrants further study.

Young people in rural areas, like their urban counterparts, often attend secondary schools which are ill-equipped to prepare them for college. Although several government programs have been instituted with the intent of leveling the playing field, the nation's rural students still suffer from a lack of resources which can lead to lower standardized test scores and poor attendance, leading to a lower graduation rate. As Stern writes:

> Circumstances largely shaped by national and international forces have led to worse-than-average poverty, unemployment, underemployment, malnutrition, inadequate housing, inferior or nonexistent health care facilities, diminished social services, and emigration. These had the effect of undermining the economic and social stability in

> much of Rural America… these conditions affected education as well. Local communities rely heavily on the use of property taxes to fund education. As property values erode with the declining fortunes of rural communities in many states, there is generally less to spend. The result for much of Rural America is underfunded schools, declining enrollments, limited curricula, aging facilities, and persistent pockets of functional illiteracy. (Stern, 21)

Of Ohio's 88 counties, 48 are categorized as non-metropolitan. However, the numbers and proportion that rural students are of a state's student population are independent of the state's geographic size. (Stern, 2) For example, most rural schools and rural districts are small, reflecting the low density of the populations they serve. (Stern, 3) However, the Ohio high schools that I have chosen to study range in size from 61 to 1418 students. To put this into perspective, I graduated from a metropolitan high school with approximately 1400 students. So the largest of the schools that I surveyed were comparable in size to a metropolitan public high school.

U.S. public schools are primarily supported by state and local funds. To augment the state contributions, most states permit school districts to raise their own revenues, which are called local leeway funds. Traditionally, these have been drawn from local property taxes. This practice has led to marked disparities in education funding levels across the country and even within states because tax yields are so uneven. (Stern, 47-48) This means that when comparing a wealthy district to a poor one, the wealthy district can afford to have a lower tax rate if it so chooses, because the lower percentage of higher incomes creates the same amount of wealth as a higher tax of lower incomes; however, to the district with the lower average income, this tax is much more demanding on individuals. Thus districts often only tax what the inhabitants are

able to pay, leading to great differences in the amount of income generated from the leeway funds. According to the Ohio Department of Education, "State funding for schools is calculated using a complex formula. The amount and type of state funding a district receives from the state is determined by factoring a number of variables." Insufficient data are available to allow me to recreate all of the variables that the State of Ohio uses. However, a hypothesis I would like to test is that of determining whether correlation exists between the amount of funding students in rural schools receive and their graduation rate.

In addition, the Ohio Graduation Test was designed to compel students to demonstrate proficiency before graduation from high school. So I would like to know if the pass rate on the Ohio Graduation Test truly does line up with the graduation rate in these rural areas, where students often don't receive the academic support that they need.

Research Questions

1. Does the level of state spending per pupil affect the graduation rates?
2. How do scores on standardized tests correlate with the graduation rate? With the level of state spending?

Limitations

General statements about rural communities and their schools must be tempered by an awareness that a wide diversity of rural communities, schools, and mutual interactions exist in the country. (Stern, 21) As was previously stated, the sizes of those districts and schools that were studied varied greatly, and thus I must keep from making generalizations as much as possible. I realize that to make generalizations is inevitable, especially in such a limited review as I am conducting. But it is always beneficial to include a footnote or aside to explain the exceptions to a generalization.My data is cross-sectional only, except for graduation rate (the

Y-variable) whose publication lags a year according to my sources. Thus it is published with the next years' data. R-square values and other statistics are generally not as good as for a time-series model.

Although Stern's research is slightly outdated, the data brings up some excellent points to consider. First, although I chose to study only non-metropolitan counties, many rural schools fall within these counties and major subsets of the rural population could have been overlooked. Second, previous analyses suggest rural schools have limited fiscal resources to address the rising costs of education. This, in addition to the fact that these rural counties have significantly varying levels of wealth, and state funding is less based on the wealth of the surrounding county, is why I chose to study only state per-pupil funding as opposed to local per-pupil funding.

Literature Review

There has been a limited amount of literature published on the subject of the Ohio Graduation Test results and their correlation with graduation rates. In addition, I found very little literature dedicated to school funding at all, and none about its impact on the graduation rate. The literature I found most helpful was often limited by its date of publication, which was often written circa 1980. This alone shows that much more research should be done on the subject of both the Ohio Graduation test and school funding.

Reducing Dropouts in Ohio Schools: Guidelines and Promising Practices **Department Pupil Attendance/Reducing Dropouts Task Force; Ohio State Board of Education. 1988.**

The objective of this study was to "put in a manageable form what other states and independent researchers have found useful in reducing dropouts" (2) and to "assist districts in mounting their own efforts at dropout prevention, intervention, and remediation." (2)

This study was conducted by a task force designated by the 1988 Ohio State Board of Education. It included a literature review using published statistics and analyses of programs that were already in place to reduce the dropout rate.

The board compiled the findings that the literature had brought forth. Among them:

1. Dropouts are more frequently unemployed… pay less tax monies and are more often on welfare… have fewer employment opportunities… experience less sense of worth. (3)
2. Minorities are over-represented among dropouts. (3)
3. Gifted students (ones with high ability but low achievement) are often overlooked. (4)
4. There are three broad categories of reasons for dropping out of school: school-related, economic, and personal. The most influential school-related reason for which students drop out is poor performance. (4-5)
5. Some of the school-related characteristics of potential dropouts were a high rate of absenteeism, low academic achievers, are enrolled in a general course of study rather then vocational education, and experience difficulty in mathematics. (5)

The board also listed several problems with current dropout-reduction programs that were identified through the study. The encapsulating reason was "America's failure to achieve for its young people full participation in the high school experience" (9) In addition, many of the

resolutions and policies are inadequate to handle the support of a well-defined set of policy implementation procedures.

"The authors of this handbook recommend that educators and practitioners investigate in greater detail the literature relating to dropouts, especially the formal studies presenting systematic literature reviews." (51)

Hawk, Johnathan D. ***Funding Sources Implementing Technology Standards in Rural Schools*****. Dissertation; University of Nevada, Las Vegas. May 2001.**

The objective of this study was to "collect and analyze data regarding the impact that E-rate and other technology funding sources had on the implementation and progress towards reaching national educational technology standards…" (Hawk 7) E-rate stands for "Educational Rate", which was a bipartisan bill designed to give schools discounts to provide access to new technologies. (Hawk 4)

This was a dissertation conducted by a Ph.D student at the University of Nevada. He used a random survey to gather the opinion of 309 rural school superintendents as well as hard data on demographics. Using a grading system of (A, B, C, D, F, or I) he created a frequency matrix, which was then used to determine an overall perception.

Hawk stated that the information gained has "offered suggestions… to policy makers on possible interventions to implement future technology programs…" (Hawk 11) Hawk found that local funding sources contributed a great deal to reaching national technology standards. It also indicated that the superintendents felt that the E-rate and other federal funding sources had little to no contribution towards reaching those standards. "State funding also lacked homogeneity across all six NETS (national standards)…" (Hawk 85). Finally, Hawk found that the rural districts utilized these funds in no significantly predictable way.

Hawk stated that a further qualitative study was needed to obtain even more accurate information as to why superintendents answered in the ways that they did. In addition, more research is needed to see if there is adequate funding to purchase technological resources for rural schools.

Stern, Joyce D. *The Condition of Education in Rural Schools*. U.S. Department of Education; Office of Educational Research and Improvement Programs for the Improvement of Practice. June 1994

As stated, the objectives of this work were "To describe a full range of data on elementary and secondary education in rural schools" (Stern iii) and "to offer… a structure for considering the issues [without] prescribing how these issues should be addressed." (Stern iv).

Although the approach to research was not specifically stated, Stern et al. conducted a literature review using government surveys and published statistics.

Stern listed 12 major items of central information. They included the following:

1. The numbers and proportion that rural students are of a state's student population are independent of the state's geographic size; the implication being that studies are often hard to conduct.
2. Many schools that are defined as "rural" are located in metropolitan counties.
3. Most rural schools and rural districts are small (district enrollments of less than 2,500)
4. Rural residents contribute a greater percentage of their income for schooling, but are hampered by the high cost of education… they face major difficulties in meeting demands of the evolving federal and state reform agendas.
5. Little information exists on rural school finance or on how rural schools are responding to reform measures. Analyses… suggest rural schools have limited fiscal resources to address the rising costs of education.
6. (Rural) Students have less opportunity to continue their education. As a result, fewer dropouts return to complete high school…

Stern also listed several problems that were identified through the study, including:

1. The stability of rural communities was severely undermined (economic problems…) led to increased poverty, emigration, and a dramatic surge in single-parent families.
2. The system of school finance in the states leaves property-poor school districts at a disadvantage in providing adequate support for schools.
3. The depth and breadth of curricula in small secondary schools are generally less than in larger schools, that is, there are relatively limited opportunities for alternative and advanced courses.

Stern stated that there is a need for additional research, including a more comprehensive typology of rural communities so that these issues can be addressed and specific programs created to address the educational problems and needs of the rural school.

Warnock, William. ***The Impact of Ohio's Occupational Work Adjustment Program on Students in Selected Southern Ohio Schools*****. A thesis presented to the faculty of the College of Education, Ohio University. August 1996.**

The objective of this study was to "identify important factors related to students being at-risk of dropping out of school and examine some indicators of the influences of the Occupational Work Adjustment (OWA) programs on those factors in selected schools in southern Ohio." (Warnock 5) The author stated that his study would be one of the only ones of the program, thus indicating its importance. (Warnock 6)

This study was a dissertation conducted by a student at Ohio University. He studied 50 random southern Ohio schools to glean data which he then analyzed in a spreadsheet and compared from the year 1992 to 1994. The variables that were compared were "classes failed, failure of previous year, days absent, suspensions, and days of suspensions." (Warnock 31)

Warnock found that there were many influential factors (such as irregular attendance and academic failures) to the dropout rate of individual schools, and that often, they were correlated. He also found that after completing the OWA program, the number of students who failed was lessened by 26 percent.

Warnock recommended that further studies be conducted in this area to assess other successful programs and further factors to the dropout rate.

Materials and Methods

In order to provide complete clarity, I have listed my regression methods on a step-by-step basis.

1. I assessed all public schools in Ohio using the Ohio Government Education website. The assessment included gathering all relevant data, which is listed in table 3.
2. Each county that was designated non-metropolitan was included in the study (See Figure 1).
3. I expunged schools without adequate information. These included all schools which contained any grade other than 9-12, and those that were for grades 9-12 but did not have data for all the variables in my study.
4. For counties with more than five qualifying schools, I randomly chose five so that the sample size wasn't skewed by choice of area. I did this because I wanted a good sampling of all non-metropolitan counties, regardless of income, so that the local taxes are not as big of a factor.

The counties which I studied were:

Ashland	Henry	Paulding
Ashtabula	Highland	Perry
Athens	Hocking	Pike
Auglaize	Holmes	Putnam
Champaign	Huron	Ross
Clinton	Jackson	Sandusky
Columbiana	Knox	Scioto
Coshocton	Logan	Seneca
Crawford	Marion	Shelby
Darke	Meigs	Tuscarawas
Defiance	Mercer	Van Wert
Fayette	Monroe	Vinton
Guernsey	Morgan	Wayne
Hancock	Muskingum	Williams
Hardin	Noble	

For an overview of these counties, please see Table 1.

The counties Adams, Gallia, Harrison, and Wyandot counties were non-metropolitan by description, but none of their schools fit my criteria so I did not include these counties in my study.

The mathematical description of this study is listed in Table 2.

Results and Discussion

I have included two tables of results in this paper which I found to be significant and warranting discussion. They are the correlation of the variables (Table 4) and the parameter estimates of the regression equation (Table 5).

Statistical Significance

According to Sandra Schlotzhauer, author of *SAS System for Elementary Statistical Analysis*, statistical significance is based on p-values (152.) She says about statistical significance:

> Choosing the significance level is a way of limiting the risk of being wrong. Specifically, what chance are you willing to take that you are wrong in your conclusions?... When you perform a statistical test, if the attained probability (the *p*-value) is les than the reference probability (the α-level), you conclude that the result is statistically significant.
>
> The choice of the significance level (or α-level) depends on the risk of making a Type I error that you are willing to take. Three levels are commonly used: 0.10, 0.05, and 0.01. The situation you're in should help determine the level of significance you choose…if you're doing work where the consequences of rejecting the null hypothesis are not so severe, then an α-level of 0.05 or 0.10 may be more appropriate. (Schlotzhauer, 152-153.)

My null hypothesis was that the variable isn't significant. When I considered what I was testing, I saw that there were a lot of variables and thus ways in which I could come to a wrong conclusion. In addition, the consequence of rejecting my null hypothesis did not seem to be severe, since my test was more hypothetical than challenging an established principle. Based on this, I chose an α-level of 0.10, which is like saying there is a ten percent chance that the results could have happened by chance.

After conducting the test, I looked at the column which held the p-value, and noted whether or not it was less than 0.10; if it was, the variable was significantly significant. By this measure, the variables which were found to be statistically significant were: Number of Standards Met, Reading OGT, Social Studies OGT, Science OGT, Reading 11th Grade, Science 11th Grade, and Performance Index Score.

Parameter Estimate Discussion per Variable

1. Intercept (Int): In a regression equation, the value of the parameter estimate with regards to the intercept is the value of the dependent variable (graduation rate) when all of the independent variables equal zero. I found that this value was equal to 49.82- so if all of the independent variables that I measured were eliminated, the graduation rate would still stand at 49.82%. However, often in equations with so many variables, the intercept has little meaning. In addition to that, the value judgement of the graduation rate could be subjective- some might say 49% is decent, while others might argue anything under 85% isn't acceptable. So I am not counting on this fact as hard evidence for any theory or discussion.
2. School Funding Level (SF3): SF3 was not found to be significant, which seemed surprising at first. I found that the parameter estimate for SF3 was .000503. (Table 5) This means that a one-unit increase per pupil in state funding improved the graduation rate by only .0005%. So in theory, when an extra $500 of state funding was allotted for a student, his or her probability of graduating increased by only .25%, or one-fourth of a percent. However, the parameter estimate is still positive, meaning that an increase in funding can increase graduation rate. One theory that can be brought forth is that there may be a minimum threshold level

that the state funding needs to reach before it has much impact. So perhaps if school funding was increased until it reached that threshold, its p-value would decrease and it would become statistically significant. Another theory that I have is that state funding truly may not be significant, but state funding combined with the district funding (or, leeway funding as I discussed earlier), it is significant.

3. Number of Standards Met (NStand): The highest parameter estimate seemed to be for Number of Standards met, but that was actually an error on my part. When I calculated Nstand, I entered the value into the regression equation as decimals instead of whole-number percentages. For instance, for a 93% passage I entered .93 instead of entering 93.0. Thus, I needed to divide all of my results by 100. When this is done for the parameter estimate, Nstand is actually .1123 instead of 11.23, a reasonable output.
4. Ohio Graduation Tests (ROGT, MOGT, WOGT, SSOGT, SCOGT): These had some of the most surprising results. Each Ohio Graduation Test parameter estimate was negative, and three results were found to be significant. This negative parameter results meant that having students pass these tests corresponded with doing worse in graduating. However, these tests were instituted in order to prepare kids for graduation and college so to take these results as fact would be a major upheaval of an institution. Instead of reading far into these results, I ran an experimental regression in which each group of variables was added one at a time.
    a. Phase 1: SF3, NStand
    b. Phase 2: ROGT, MOGT, WOGT, SCOGT

c. Phase 3: R11, M11, W11

d. Phase 4: SS11, SC11

e. Phase 5: Attend, Perform

f. Phase 6: RAYP, MAYP, OAYP

The result of this experimental regression ties in with the AYP scores as well (see below). Basically, this experimental regression showed that adding the AYP scores (Phase 6) caused the ROGT result to become statistically significant, which was unwanted as it has a negative value. In addition, all of the AYP values were statistically insignificant anyway- so leaving them out of the equation would be a good step for future regressions.

5. 11^{th} Grade Tests (R11, M11, W11, SS11, SC11): These results had largely the same results as the Ohio Graduation Tests, in that many were found to have negative parameter values and only a few were even found to be significant.
6. Attendance (Attend): The attendance rate also had a negative parameter estimate, but was found to be statistically insignificant.
7. Performance Index Score (Perform): The Performance Index is a calculation that measures achievement/OGT test performance at the 3^{rd}, 4^{th}, 5^{th}, 6^{th}, 7^{th}, 8^{th}, and 10^{th} (OGT) grade levels based upon the number of students at each performance level. The reason that some scores are higher than 100 is that being proficient is measured as being 1.0, so if a student is measured as accelerated or advanced, they receive a score higher than 1.0 The Performance Index Score was found to have a positive parameter estimate, and was found to be statistically significant. This is a good indicator that perhaps the OGT parameter results were just an

outlier, and could mean that the better students do throughout their whole academic career (1st through 12th grade) at these tests, the more likely they are to graduate.

8. Reading Adequate Yearly Progress Met (RAYP), Math Adequate Yearly Progress Met (MAYP), Overall Adequate Yearly Progress Met (OAYP): These variables were dummy variables- either a school met the standard or did not meet the standard, and it was entered into the equation as 1 (Met) or 0 (Not Met.)All of these results were found to be statistically insignificant, although parameter estimates were both positive and negative.

Correlation

Correlation is a single number that describes the degree of relationship between two variables. The value of the correlation will always be between -1.0 and +1.0; a negative number implies a negative relationship, just as a positive number implies a positive relationship. Generally, an absolute value of .7 indicates a strong relationship, be it positive or negative. In this regression equation, correlation between the variables was generally very low. This is a good thing; if the variables were highly correlated (multicollinearity) it would be difficult to tell which was truly having an effect on the dependent variable. Multicollinearity doesn't mean that the regression outputs are false, but it does sometimes throw into doubt the value individual variables.

The fact that the variables are not highly correlated is good, and could lead to further research and more highly refined regressions. For instance, I could possibly more clearly see the effects of the individual independent variables by conducting more regression runs in which I

brought in just a few variables at a time. I could also calculate the direct correlation between the dependent and independent variables by performing correlation using Excel.

Table 1- Description of Counties

County Name	2007 Population	Median Household Income	Persons 25 and over with no high school diploma (percent of all persons 25 and over)	Students in Public Schools
Ashland	54,902	39,179	5,553 (16.7)	7,316
Ashtabula	101,141	35,607	13,659 (20.1)	16,622
Athens	63,275	27,322	5,314 (17.1)	8,270
Auglaize	46,429	43,367	4,311 (14.3)	8,101
Champaign	39,522	43,139	4,535 (17.7)	7,797
Clinton	43,071	40,467	4,339 (16.9)	8,183
Columbiana	108,698	34,226	14,770 (19.4)	17,048
Coshocton	36,341	34,701	5,148 (21.3)	5,847
Crawford	44,227	36,227	6,216 (19.8)	7,186
Darke	52,205	39,307	6,041 (17.2)	8,098
Defiance	38,543	44,938	3,896 (15.3)	6,540
Fayette	28,308	36,735	4,032 (21.3)	4,762
Guernsey	40,409	30,110	5,786 (21.6)	5,702
Hancock	74,204	43,856	5,308 (11.6)	11,129
Hardin	31,650	34,440	3,738 (19.4)	5,651
Henry	28,931	42,657	3,103 (16.5)	5,798
Highland	42,653	35,313	6,238 (23.7)	7,889
Hocking	28,959	34,261	4,119 (22.0)	4,062
Holmes	41,369	36,944	10,185 (48.5)*	4,531
Huron	59,801	40,558	7,123 (19.0)	11,194
Jackson	33,314	30,661	5,648 (26.5)	5,583
Knox	58,961	38,877	6,277 (18.2)	8,937
Logan	46,279	41,479	4,900 (16.4)	7,783
Marion	65,248	38,709	8,753 (19.7)	13,071
Meigs	22,895	27,287	4,181 (26.8)	3,480
Mercer	40,888	42,742	4,110 (16.0)	8,317
Monroe	14,258	30,467	2,236 (21.2)	2,636
Morgan	14,613	28,868	1,927 (19.4)	2,146
Muskingum	85,333	35,185	10,620 (19.4)	16,685
Noble	14,096	32,940	1,974 (21.4)	2,010
Paulding	19,182	40,327	2,411 (18.4)	3,245
Perry	34,839	34,383	4,565 (21.1)	6,329
Pike	27,918	31,649	5,291 (29.9)	5,734
Putnam	34,635	46,426	2,989 (13.9)	6,235
Ross	75,398	37,117	11,796 (23.9)	12,752
Sandusky	60,997	40,548	7,252 (17.9)	10,404
Scioto	75,958	28,008	13,523 (25.9)	13,029
Seneca	56,705	38,037	6,306 (16.9)	7,836
Shelby	48,834	44,507	5,608 (18.5)	8,745
Tuscarawas	91,398	35,489	11,932 (19.7)	15,124
Van Wert	28,889	39,497	2,601 (13.4)	4,350
Vinton	13,372	29,465	2,409 (29.3)	2,384
Wayne	113,554	41,538	13,959 (20.0)	17,403
Williams	38,378	40,735	4,353 (16.9)	6,253

Table 2- Mathematical Description of Study

Sample Size (N)	Explanatory Variables (K)	Degrees of Freedom (N-K-1)	Dependent Variable (Abbreviation in Table 3)	Explanatory Variables (Abbreviation in Table 3)	Dummy Variables (Abbreviation in Table 3)
136	18	117	Final Graduation rate 2006-07 (Grad)	-Per-pupil spending by the state (SF3) * -Number of Standards Met (Nstand) (%) -Reading OGT 2007-08 (ROGT)** -Math OGT 2007-08 (MOGT)** -Writing OGT 2007-08 (WOGT)** -Social Studies OGT 2007-08 (SSOGT)** -Science OGT 2007-08 (SCOGT)** -Reading 11th grade 2007-08 (R11)** -Writing 11th grade 2007-08 (M11)** -Social Studies 11th grade 2007-08 (SS11)** -Math 11th grade 2007-08 (M11)** -Science 11th grade 2007-08 (SC11)** -Attendance 2007-08 (Attend) -Performance Index Score 2007-08 (Perform)	-2008 Reading Adequate Yearly Process (RAYP) -2008 Math AYP (MAYP) -2008 Overall AYP (OAYP)

* Per-pupil spending by the state is only measured at a district level, but is roughly the same for all public schools

** OGT and 11th grade results are measured by the percent of students who tested “at or above proficient

***AYP is measured by “Met” or “Not Met”

Table 3- Original Data

Bldg	Grad	SF3	Nstand	ROGT	MOGT	WOGT	SSOGT	SCOGT	R11	M11	W11	SS11	SC11	Attend	Perform	GAYP	RAYP	MAYP	OAYP
Ashland HS	88.1	2746.98	0.91667	91.5	84.5	88.4	78.2	76.8	95.2	91.4	95.5	87.2	89	94.1	98.6	1	1	1	1
Hillsdale HS	100	3529.29	1	89	84	87.1	81	80	95	92	96	92	90	94	99.6	1	1	1	1
Loudonville HS	94.4	3379.98	0.91667	87.2	85.5	84.6	70.9	76.9	97.8	94.5	97.8	93.4	91.2	95.1	96.7	1	1	1	1
Lakeside HS	85.4	4428.15	0.5	83.6	78.4	84.7	72.4	71.9	90	85.2	86.6	80	74.5	91.7	93.7	1	0	1	0
Conneaut HS	96.7	4853.11	1	91.8	81.4	91.2	81.9	77.3	99.4	97.5	99.4	97.5	94.9	93.9	98.1	1	1	1	1
Edgewood HS	97.7	2141.71	0.91667	84.5	79.8	82.5	77.8	70.6	94.9	93.8	96.1	93.3	91	93.6	95	1	1	1	1
Grand Valley HS	96.1	3963.43	1	90.2	85.9	93.5	75	75	95.5	91.8	94.5	89.1	86.4	93.6	98.1	1	1	1	1
Jefferson Area Sr HS	97.6	3822.82	0.83333	90.9	84.4	89.8	83.9	80.6	93.8	85.6	94.5	84.2	84.9	93.4	101.2	1	1	1	1
Alexander HS	98.1	4925.3	1	79.4	84.9	91.3	81	76.2	88.4	86.8	93	85.3	86	95.2	99.2	1	1	1	1
Athens HS	99.1	3989.48	1	82.7	85	83.6	82.7	82.2	93.2	91.1	94.3	90.1	87	93.5	99.4	1	0	0	0
Federal Hocking HS	98.6	5382.75	0.5	79.8	74	80.6	73.1	70.2	92.3	85.8	92.4	81.1	79.2	92.5	92.8	1	0	0	0
Trimble HS	85.2	7128.09	0.5	73.6	79.3	82.8	57.5	69	87.1	87.1	88.6	82.9	82.9	94.8	91.2	1	0	1	0
Nelsonville-York HS	92.4	6338.66	0.58333	73.3	67.8	89.5	72.4	65.5	93.8	90.3	91.2	87.6	87.6	92.9	91.3	1	0	1	0
Memorial HS	97.5	3887.83	1	83.7	83.7	88	77.9	76	91	89.1	91.5	87.6	86.1	95.3	98.1	1	0	0	0
Minster HS	100	1070.23	1	97.3	98.7	96	96	94.7	100	100	100	100	100	96.6	109.9	1	1	1	1
New Bremen HS	97	3391.69	1	97.3	95.9	95.9	91.9	86.5	100	100	100	97.2	97.2	96	108.5	1	1	1	1
Graham HS	92.8	4444.73	0.91667	84.2	85.3	84.3	76.8	74.7	93.6	92	92.8	90.4	92	94.6	96.7	1	1	1	1
Triad HS	95.6	4709.54	1	88	86.9	94	90.2	88.1	95.5	92.5	97	95.5	95.5	93.6	98.9	1	1	1	1
Urbana HS	95	3119.48	1	88	83.2	87.4	85	80.8	94.5	92.1	95.3	90.6	91.3	94.1	99.4	1	1	1	1
Blanchester HS	93	5399.67	1	84.4	89.1	87.8	85	80.3	93.3	95.3	97.3	93.3	91.3	93.2	100.2	1	0	1	0
Clinton-Massie HS	99.2	4438.11	1	80	76.9	83.1	75.4	75.4	97.9	93.6	97.2	90.8	91.5	95.6	95.2	1	1	1	1
Wilmington HS	94.1	2383.6	1	90.6	86.9	90.6	79.8	80.8	94.5	92	95.1	92.6	88.3	94	99.9	1	0	1	0
Columbiana HS	95.9	2454.77	1	97.2	97.3	94.5	90.4	89	100	98.8	100	97.7	98.8	94.6	105.7	1	1	1	1
East Liverpool HS	98.9	5534.29	0.5	77.7	70.3	80.6	60	59.6	88.3	85.8	90.7	77.2	77.2	90.3	88.2	1	0	0	0
East Palestine HS	93.6	4684.08	1	89.2	80.9	87.4	81.1	77.5	98.9	94.5	97.8	94.5	91.2	94.9	98.1	1	1	0	0
Leetonia HS	100	4925.76	1	94.1	89.7	95.6	83.8	76.5	100	98.3	100	91.5	93.2	93.1	99.9	1	1	1	1
Salem HS	83.2	2580	0.75	88.7	76.2	89.4	78.8	71.1	92.7	88.1	93.4	88.7	87.4	92.1	95.6	1	1	0	0
River View HS	93.2	3274.27	1	85.5	88.9	89.5	85.5	81.3	90.3	93.4	93.9	89.3	88.3	94.7	101.1	1	1	1	1
Bucyrus HS	94.5	4223.36	0.66667	82.9	74.1	81.7	69	75	92.9	87.9	91.5	83.7	80.9	93	93.2	1	0	0	0
Col Crawford HS	94.7	3002.94	1	90.8	88.5	88.5	89.7	87.4	96.3	91.5	93.9	90.2	86.6	95.6	103.6	1	1	1	1
Greenville Senior HS	91.7	3035.26	0.83333	81.3	77.9	76.9	75.5	70.1	92.7	88.8	91.5	85.8	81.9	100	93.1	1	0	0	0
Ayersville HS	97.5	3809.93	1	92.1	88.9	90.5	87.3	82.5	98.5	98.5	100	94	97	96	101.8	1	1	1	1
Defiance HS	95.2	3461.86	1	89.8	84.7	88.8	84.2	81.9	96.2	91.8	95.7	90.2	88.6	93.6	100.5	1	0	0	0
Fairview HS	93.9	4434.66	1	86.3	90.2	87.3	85.3	83.3	96.9	98.5	96.9	95.4	98.5	94.7	100.7	1	1	1	1
Tinora HS	95.7	1892.71	1	95.7	94.7	96.8	90.4	91.5	93.9	97	97	92.9	97	96.1	106.4	1	1	1	1
Miami Trace HS	96.2	3595.83	1	90.7	82	84.5	83	78.4	95.7	90.8	95.7	92.9	90.8	93.9	97	1	1	1	1
Washington HS	87.3	4614.91	0.91667	84.5	85.1	88.5	82.4	79.1	89.6	92.8	93.6	88.8	88	96.1	98.7	1	0	1	0
Cambridge HS	91.4	4549.55	0.41667	83.3	72.5	84.1	71.5	66.1	85.3	82.2	87.7	79.1	77.3	92	90.3	1	0	0	0
Meadowbrook	78.9	3597.57	0.58333	81.5	75.9	79.9	72.4	68.7	86.9	86.9	89.3	84.4	82.8	94.1	90	1	1	1	1

HS																			
Buckeye Trail HS	91.4	5321.32	0.91667	86.7	85.7	89.8	80.6	78.6	95.7	94.6	96.8	88.2	90.3	92.7	96.6	1	1	1	1
Arcadia HS	95.5	4021.25	1	92.3	84.3	92.3	84.6	88.5	97.8	100	100	95.7	93.5	94.4	102.3	1	1	1	1
Cory-Rawson HS	100	3698.5	1	90.5	92.1	92.1	88.9	90.5	96.7	96.7	100	91.8	96.7	95.9	104.2	1	1	1	1
Liberty-Benton HS	98	3265.97	1	87.9	91.6	95.3	84	88.8	93.6	95.5	98.2	93.6	96.4	96	104.9	1	1	1	1
McComb Local HS	96.4	3862.83	0.91667	88.2	84.3	88.2	82.4	76.5	94.6	94.6	98.2	85.7	83.9	96	99.1	1	1	1	1
Van Buren HS	100	218.29	1	95	90	96.3	92.5	90	95.8	98.6	95.8	95.8	94.4	96.4	105.3	1	1	1	1
Kenton HS	86	4188.87	0.75	80.6	72.2	79.9	77.8	61.1	97.9	95.8	94.4	90.2	91	95.5	92.8	1	0	0	0
Riverdale HS	91.8	4475.88	1	80.9	78.7	85.1	76.6	76.6	95.2	88.7	95.1	88.7	87.1	94	96.3	1	1	1	1
Upper Scioto Valley HS	91.8	4637.57	0.5	89.8	80	86.4	67.8	72.9	87.5	81.3	85.4	77.1	75	91.6	93.8	1	1	1	1
Patrick Henry HS	98.9	3423.49	1	92.2	85.7	89.6	94.8	90.9	97.1	92.8	98.6	97.1	94.2	95.3	105	1	1	1	1
Liberty Center HS	88.3	3959.44	0.91667	89.4	87.1	90.6	91.8	81.2	97	93.1	99	91.1	92.1	95.6	101.9	1	1	1	1
Napoleon HS	94	2552.46	1	93.9	85	95.6	88.3	85.6	94.5	94	97.3	92.9	91.3	94.7	102.3	1	1	1	1
Fairfield Local HS	93.4	5249.06	1	97.6	90.5	95.2	92.9	88.1	90	92.9	92.9	85.7	87.1	93.1	105	1	1	1	1
Hillsboro HS	92.7	3903.89	1	84.2	79.5	80.7	83.1	75.4	93.7	89.3	95.1	85.5	85	93.1	95.7	1	0	1	0
Lynchburg-Clay HS	93.6	5660.49	0.75	81.9	73.3	81.9	73.3	73.1	93.5	88.9	94.4	90.7	88	94.3	93.5	1	1	1	1
McClain HS	84	5128.65	0.66667	78.7	72.9	83.1	71.8	65.7	89	86.5	90.8	85.3	85.3	93.8	90.1	1	0	1	0
Whiteoak HS	94.4	5302.59	0.75	86	77.2	91.2	86	77.2	92.1	85.5	93.4	81.6	80.3	92.4	97.3	1	1	1	1
Logan HS	96.5	4786.02	1	84.9	84.4	85.6	82.7	77.6	95.3	91.5	94.4	92.5	90.6	94.4	98.9	1	0	0	0
West Holmes HS	94.5	3940.35	1	82.7	82.7	87.9	85	80.9	91.1	92.1	94.1	91.1	89.7	94.6	99.9	1	0	1	0
New London HS	88.9	4655.2	0.91667	92.7	93.9	93.9	87.8	86.6	97.9	95.7	97.9	95.7	96.8	94.9	104.1	1	1	1	1
Norwalk HS	83.5	3523.39	0.75	87.6	78.1	87.6	78.7	74.2	94.1	95.2	94.7	91	90.4	92.6	96.2	1	1	1	1
South Central HS	96.6	4830.01	1	89.8	88.1	98.3	81.4	83.1	92.3	90.8	92.3	86.2	90.8	95.9	102.2	1	1	1	1
Willard HS	93.9	4016.58	0.91667	89.4	83.1	83.8	85.9	79.6	92	90.1	89.6	87.6	86.4	92.8	99.8	1	1	1	1
Western Reserve HS	94.7	4743.9	1	86.1	86.1	88.9	82.4	76.9	94.6	93.5	96.8	92.5	91.4	94.7	99	1	1	1	1
Jackson HS	93.4	5298.03	0.75	85.3	71.1	77.7	77.7	69.3	90.5	86.6	90.1	87.6	83.6	93.6	92.6	1	0	0	0
Wellston HS	91.1	6133.03	0.75	86	82.2	92.2	83.7	72.1	86.4	87.4	90.4	84.5	78.6	93.7	99.1	1	1	1	1
Centerburg HS	98.8	4277.19	1	86.1	84.2	91.1	81.2	83.2	95.7	92.5	96.8	90.3	90.3	93.7	99.9	1	1	1	1
Danville HS	95.7	4590.27	0.91667	79.7	72.9	83.1	76.3	76.3	100	94.3	97.1	85.7	94.3	95.1	95.6	1	1	1	1
Fredericktown HS	95.5	3669.21	0.91667	89	84.6	85.7	75.8	78	90.6	90.6	92.9	84.7	88.2	94.6	98.9	1	1	1	1
Mount Vernon HS	93.9	2731.73	1	85.7	83.5	86.5	80.3	81.4	95.7	94.7	96.1	91.1	92.5	94.7	98.2	1	0	0	0
Bellefontaine HS	96.2	4111.99	0.83333	86.2	72.9	84.8	81	72.9	91.2	86.6	90.7	87.6	86.1	95.3	95.5	1	0	0	0
Indian Lake HS	84.7	2588.57	0.83333	81.8	78.1	84.1	75.9	68.1	96	88.7	92.7	87.9	85.5	94.5	93.6	1	1	1	1
Benjamin Logan HS	96.1	2763.91	0.83333	90.7	87.9	87.9	84.6	75.3	90.4	85.2	91.1	83	81.5	94.9	98.4	1	1	1	1
Elgin HS	83.5	4381.86	0.41667	78.5	70.2	78.3	60.8	63.3	87.6	87.6	90.7	76.7	79.1	91.7	86.6	1	1	1	1
Harding HS	78.3	4879.63	0	71.8	72.1	72.5	65	63.1	84.4	83.2	84.5	79.1	76.4	90.5	84.7	1	0	0	0

Pleasant HS	96.5	3215.21	1	87.5	84.6	91.3	76	79.8	96.9	96.9	95.3	94.5	95.3	93.7	98.4	1	1	1	1
Eastern HS	90.6	5335.36	0.58333	94.1	72.1	91.2	75	69.1	87.5	80.4	85.7	77.6	77.6	94	95.8	1	1	0	0
Meigs HS	85.8	6247.39	0.33333	78.7	56.5	71.1	44.7	47.8	91.3	84.7	92	80.5	81.2	93.5	80.5	1	1	0	0
Southern HS	95.6	5245.48	0.41667	84.2	70.2	86	64.9	64.9	84	81.1	88	75.5	75.5	93.9	91.8	1	1	1	1
Celina HS	93	3463.28	1	87.6	87.7	87.7	75.1	79.9	94.7	94.7	95.9	91.4	89.8	95.2	99.1	1	0	0	0
Coldwater HS	96.6	4528.84	1	96.2	97	96.2	93.9	90.2	99.2	100	99.2	96	96.8	96	108.7	1	1	1	1
Marion Local HS	100	4649.87	1	96.4	92.8	98.8	91.6	92.8	100	100	100	100	97.5	96.5	108.1	1	1	1	1
Parkway HS	98.7	4464.06	1	88.2	88.2	87.1	90.6	84.7	98.9	97.7	100	97.7	96.6	95.9	102.3	1	1	1	1
St Henry HS	100	4936.67	1	94.2	96.1	94.2	90.3	92.2	95.7	95.7	95.7	93.5	95.7	97.1	106.1	1	1	1	1
River HS	86.9	3930.07	0.91667	92.3	79.5	80.8	78.2	79.5	100	97.2	100	97.2	97.2	95.1	94.9	1	1	1	1
Monroe Central HS	94.3	3930.07	0.83333	84.9	83.9	86.2	72.4	74.7	95.7	91.3	95.7	95.7	93.5	94.8	95.7	1	1	1	1
Morgan HS	90.2	5536.47	0.91667	85.2	84.7	85.2	82.8	76.2	92.4	91.3	95.9	83.7	89.5	93.7	97.2	1	1	1	1
John Glenn HS	92	4295.75	1	94.4	85.7	95	93.1	81.9	98.1	94.8	98.1	96.1	92.9	94.8	104.7	1	1	1	1
Maysville HS	91.7	5077.87	0.91667	82	75.6	83.1	75	72.1	98	98	98.6	93.9	94.6	93.6	94.7	1	0	0	0
Philo HS	97.1	5094.43	1	84.7	81.1	86.7	84.1	78.6	87.1	93.3	93.8	88.8	85.4	93.4	99.1	1	0	0	0
Tri-Valley HS	94.2	4251.99	1	86.4	86.5	88.4	84.5	78.6	93.3	92.5	94.9	89.8	88.2	93.8	100.2	1	0	0	0
Zanesville HS	97.4	4557.04	0.41667	74.9	75.4	76.1	65.1	61.9	82.5	76	86.8	60.1	62.8	93.3	90.8	1	0	1	0
Caldwell HS	84.1	4609.45	0.91667	88.6	87.1	91.4	77.1	81.4	97.3	93.2	98.6	94.6	94.6	94.2	98.3	1	1	1	1
Shenandoah HS	94.4	4801.36	0.66667	71.1	71.4	78.3	66.3	66.3	93.3	91	95.5	85.4	85.4	93.7	89.6	1	0	1	0
Paulding HS	93.9	4316.45	1	89.1	86.4	90	80.9	75.5	94.8	91	96.3	89.6	88.1	93	98.3	1	1	1	1
Crooksville HS	98.6	6380.4	0.75	76.1	75.6	84.4	73.3	72.2	94.8	90.9	94.8	89.7	87.2	92.9	93.1	1	1	1	1
Miller HS	94.9	6544.87	0.25	62.5	66.7	64.4	58.3	63	86.8	80.9	86.8	81.2	80	91.9	86.2	1	0	0	0
Sheridan HS	90.5	4705.83	1	83.7	85.3	83.2	75.3	81.6	92	89.9	93	88.3	89.9	93.8	96.8	1	0	1	0
New Lexington HS	85.4	5648.76	0.58333	82.7	74.8	81.3	72.7	68.3	91.4	85.9	93	85.9	85.9	92.6	92.8	1	0	0	0
Eastern HS	93.1	5564.17	0.25	87.3	67.7	77	59	72.1	84.9	76.7	80.6	69.9	78.1	91.8	86	1	1	1	1
Waverly HS	96.3	5222.54	0.41667	82.7	68.6	75.6	62.8	69.9	90.7	85.7	84.5	82	82.6	92.3	90.7	1	1	0	0
Columbus Grove HS	97.3	4341.45	1	97.6	91.6	98.8	81.9	83.1	94	97.6	100	90.5	91.7	95.1	105	1	1	1	1
Continental Local HS	91.5	4930.36	1	94.2	90.4	90.4	92.3	86.5	96.7	96.7	98.4	95.1	96.7	95.3	104.7	1	1	1	1
Miller City HS	95.2	5225.46	1	97.4	97.4	100	94.7	94.7	94.6	100	100	94.6	91.9	96.7	112.3	1	1	1	1
Ottawa-Glandorf HS	98.2	3330.03	1	96	92.7	95.4	91.4	90.1	95.6	96.9	97.5	96.2	93.1	95.7	105.8	1	1	1	1
Pandora-Gilboa HS	100	4091.79	1	95.6	97.8	100	95.6	97.8	96	90	100	90	92	95.7	109.7	1	1	1	1
Adena HS	87.7	5242.21	0.83333	84.6	79.5	77.9	78.2	71.8	94.7	88.3	93.6	91.5	90.4	93.6	94.2	1	1	1	1
Huntington HS	91.8	6707.85	0.66667	84.7	79.6	85.7	82.7	74.5	90.2	75.5	90.1	86.1	80.2	92.4	96.4	1	0	1	0
Paint Valley HS	93.3	5753.43	0.83333	82.4	77.6	79.1	77.9	73.3	92	94.7	96	88	86.7	92.8	93.9	1	1	1	1
Unioto HS	91.1	5155.9	1	84.6	82.5	82.5	84.6	76.9	91.8	88.9	91.1	86.6	87.3	93.6	98.7	1	1	1	1
Zane Trace HS	95.9	3558.59	1	88.1	82.5	84.6	78.2	75.5	92.3	86.5	94.2	89.3	85.6	94	96.2	1	1	1	1
Clyde HS	90.7	4097.36	0.83333	82.7	82.1	82.7	67.3	67.9	88.8	89.3	91.7	85.8	85.2	94	92.6	1	0	1	0
Fremont Ross HS	86.6	2651.52	0.83333	85.5	82	87.1	74.4	76.2	90.5	91.9	95.4	88.1	88.1	93.2	95.6	1	0	0	0
Green HS	95.7	3745.2	1	94.2	92.7	93.9	89.8	89.1	98.8	97.4	98.2	95.6	96.2	95.4	105.4	1	0	0	0
Minford HS	98.9	6005.15	0.83333	83.7	75.7	78.6	72.8	67	91.7	88.3	94.2	85.8	85	93.6	92	1	0	1	0
Northwest HS	93.8	6093.3	0.41667	81.2	70.7	73.7	69.9	60.2	83.5	86.8	85.1	83.5	79.3	93.1	89.7	1	1	0	0
Portsmouth West HS	96.8	3599.4	0.91667	86.7	79.2	84.2	77.5	70.8	91.3	89.3	92.2	91.3	86.4	94	96.1	1	1	0	0
Wheelersburg HS	99	4767.49	1	93.8	85.6	97.9	90.7	85.6	95.7	94.8	96.5	91.3	87.8	94.3	104.1	1	1	1	1

Seneca East HS	100	4001.61	1	93.8	86.3	92.5	82.5	91.3	96.3	95	97.5	93.8	93.8	95.6	103	1	1	1	1
Bettsville HS	100	4707.49	0.91667	76.5	94.1	82.4	70.6	76.5	100	100	92.9	100	92.9	94.4	93.8	1	1	1	1
Columbian HS	88.3	3064.23	0.91667	86	81.4	88.2	79.5	75.8	97.1	96.6	97.6	96.1	96.1	95.9	97.8	1	0	0	0
Sidney HS	93.3	2427.82	1	94.5	85.6	90.8	79.3	79	91.9	92.5	90.9	90.3	87.1	95.2	99.4	1	1	1	1
Claymont HS	95	5428.3	0.75	81.2	81.9	85.2	76.8	74.8	87.3	86.7	90.2	82.7	79.8	93.5	95.5	1	0	0	0
Dover HS	96.3	2167.21	1	96.1	92.7	91.7	88.8	88.3	97.7	95.3	98.8	96.5	92.4	96.6	106	1	1	1	1
Indian Valley HS	97.9	4554.76	1	91	84.8	93.1	87.6	84.8	94	88.9	97.4	88	88	95.2	101.9	1	1	1	1
New Philadelphia HS	96	2681.57	1	87.5	84.1	90.1	80.2	82.3	93.7	95	95.5	86	86.4	94.3	99.7	1	0	0	0
Tuscarawas Valley HS	98.7	3166.74	1	96.7	91	96.7	88.5	86.9	97.4	97.4	97.4	94	95.7	94.8	104.7	1	1	1	1
Van Wert HS	89.7	3564.32	0.91667	90.6	89.4	90.1	91.3	80.7	94.3	93.1	94.8	91.4	89.7	94.9	102.6	1	1	1	1
Vinton County HS	90.4	6439.37	0.83333	79.2	77	83.8	78.6	72.1	89.3	86	91	88.8	84.3	93.7	93.8	1	1	1	1
Dalton HS	95.9	3038.88	1	93.2	91.9	91.9	91.9	89.2	96.3	96.3	97.5	93.8	97.5	95.6	105.1	1	1	1	1
Norwayne HS	94.1	4180.21	1	92.7	93.8	89.6	90.6	89.6	93.8	100	99	92.8	93.8	94	104	1	1	1	1
Smithville HS	100	4398.33	1	96.7	95.6	90	83.3	91.1	92.2	91.3	92.2	89.3	88.5	95.5	102.3	1	1	1	1
Waynedale HS	95.4	3051.84	1	92.7	91.7	88.1	88.1	85.3	94.9	94.9	93.2	88.1	89	93	103	1	1	1	1
Wooster HS	92.7	1901.25	1	87.5	86.5	89.8	83	81	92.6	91.7	92.9	87.2	89.1	93	100.6	1	0	1	0
Bryan HS	98.9	2936.39	1	89.4	89.4	92.2	86	83.1	98.3	97.5	97.5	95	96.6	94.1	102.3	1	1	1	1
Edon HS	100	4980.54	1	87	81.5	92.6	83.3	75.9	95	95	98.3	86.7	88.3	95.9	97.9	1	1	1	1
Montpelier HS	92	4461.21	1	93.1	86.2	90.8	87.2	88.5	94.6	95.9	98.6	90.5	91.9	94.7	101	1	1	1	1

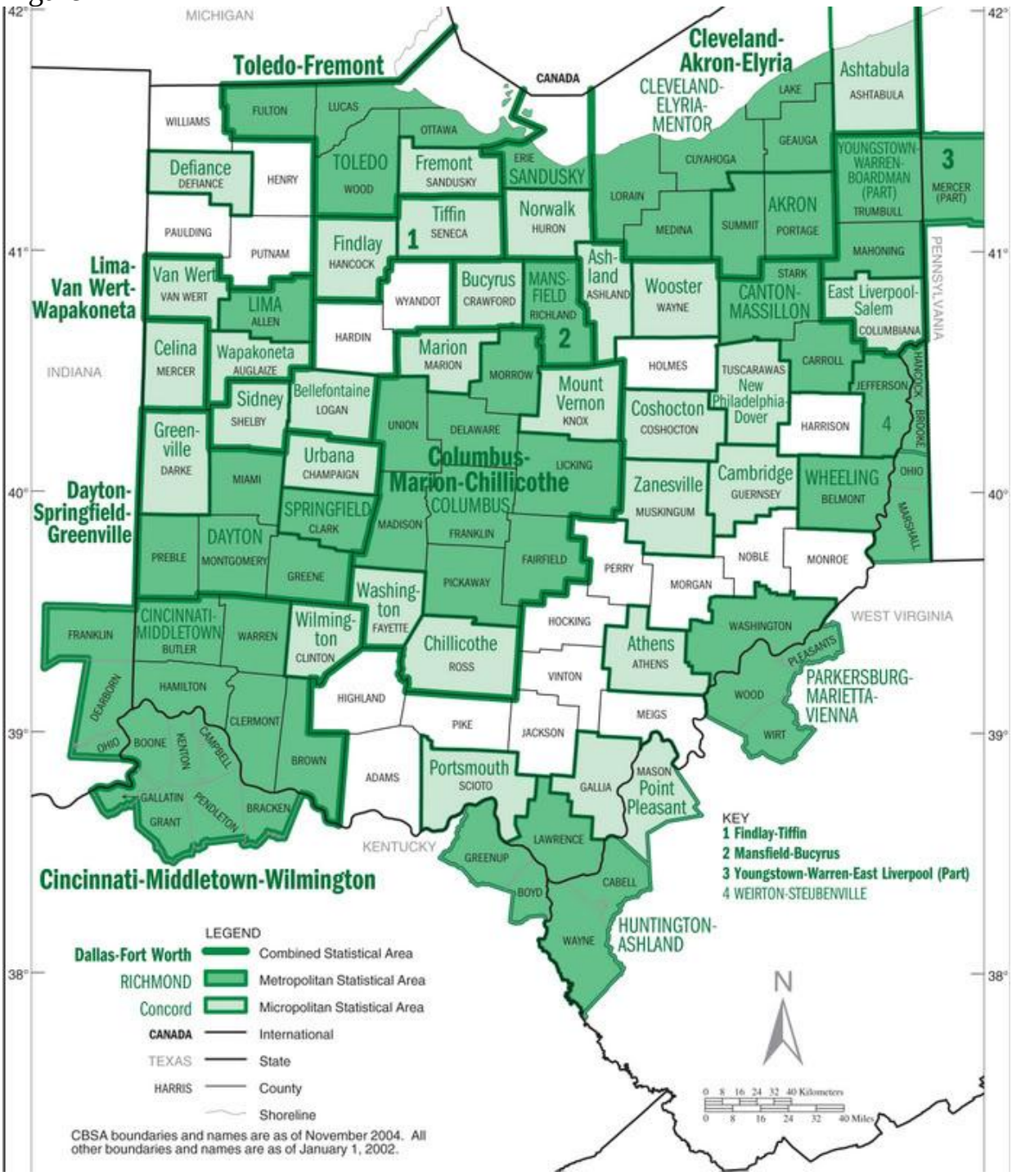
Table 4- Correlation of Estimates

Var	Intercept	SF3	Nstand	ROGT	MOGT	WOGT	SSOGT	SCOGT	R11	M11	W11	SS11	SC11	Attend	Perform	RAYP	MAYP	OAYP
Intercept	1	-0.233	0.327	-0.129	0.0123	-0.0106	0.0441	0.0946	-0.187	-0.008	-0.1	-0.013	0.1394	-0.8259	-0.0451	0.0599	-0.0835	0.0325
SF3	-0.233	1	0.1524	0.2717	0.0919	-0.0679	-0.0081	0.0035	0.1139	0.1018	-0.14	-0.039	-0.020	0.13	-0.0523	-0.010	-0.0694	0.0624
Nstand	0.327	0.1524	1	0.0366	-0.1354	-0.0512	-0.2161	0.0062	-0.025	0.0095	-0.222	-0.117	-0.006	-0.1233	0.0191	0.0122	-0.0977	0.0468
ROGT	-0.129	0.2717	0.0366	1	-0.0084	-0.2802	-0.0458	-0.1049	-0.100	0.0442	0.0348	0.0548	0.0195	0.0769	-0.1522	-0.338	0.1127	0.1425
MOGT	0.0123	0.0919	-0.1354	-0.0084	1	0.0867	0.2529	-0.1381	0.1173	-0.182	0.1309	-0.132	0.039	0.0762	-0.4597	0.1966	-0.1573	-0.164
WOGT	-0.0106	-0.068	-0.0512	-0.2802	0.0867	1	0.1826	0.1308	0.0825	-0.012	-0.097	0.0152	-0.012	0.1449	-0.448	0.064	-0.1239	-0.047
SSOGT	0.0441	-0.008	-0.2161	-0.0458	0.2529	0.1826	1	0.0399	0.0811	0.1279	-0.041	-0.213	0.0462	0.1872	-0.5999	0.16	0.0156	-0.176
SCOGT	0.0946	0.0035	0.0062	-0.1049	-0.1381	0.1308	0.0399	1	0.0116	0.1243	0.0912	0.0587	-0.294	0.1214	-0.4794	0.2196	0.0146	-0.213
R11	-0.1872	0.1139	-0.0246	-0.1003	0.1173	0.0825	0.0811	0.0116	1	-0.023	-0.430	-0.231	-0.184	0.0364	-0.0228	0.0096	0.0263	-0.059
M11	-0.0084	0.1018	0.0095	0.0442	-0.1818	-0.012	0.1279	0.1243	-0.023	1	-0.316	-0.136	-0.316	0.0255	-0.0821	0.0304	0.1159	-0.052
W11	-0.1	-0.14	-0.2223	0.0348	0.1309	-0.0974	-0.0411	0.0912	-0.430	-0.316	1	0.0865	-0.113	-0.0329	-0.0991	0.1385	-0.0363	-0.111
SS11	-0.0127	-0.039	-0.1167	0.0548	-0.1324	0.0152	-0.2132	0.0587	-0.231	-0.136	0.0865	1	-0.544	-0.0257	0.0771	-0.105	0.0584	0.1199
SC11	0.1394	-0.020	-0.0061	0.0195	0.039	-0.0119	0.0462	-0.2944	-0.184	-0.316	-0.113	-0.544	1	-0.0984	0.1005	-0.080	-0.0489	0.0332
Attend	-0.8259	0.13	-0.1233	0.0769	0.0762	0.1449	0.1872	0.1214	0.0364	0.0255	-0.033	-0.026	-0.098	1	-0.3179	0.0032	0.0201	-0.033
Perform	-0.0451	-0.052	0.0191	-0.1522	-0.4597	-0.448	-0.5999	-0.4794	-0.023	-0.082	-0.099	0.0771	0.1005	-0.3179	1	-0.171	0.0551	0.1899
RAYP	0.0599	-0.100	0.0122	-0.3382	0.1966	0.064	0.16	0.2196	0.0096	0.0304	0.1385	-0.105	-0.080	0.0032	-0.1712	1	0.1831	-0.839
MAYP	-0.084	-0.069	-0.0977	0.1127	-0.1573	-0.1239	0.0156	0.0146	0.0263	0.1159	-0.036	0.0584	-0.049	0.0201	0.0551	0.1831	1	-0.525
OAYP	0.0325	0.0624	0.0468	0.1425	-0.1642	-0.0467	-0.1756	-0.2132	-0.059	-0.052	-0.111	0.1199	0.0332	-0.0329	0.1899	-0.839	-0.525	1

Table 5- Parameter Estimates of the Regression Equation

Label	Parameter Estimate	Standard Error	t Value	p Value
Intercept	49.81515	29.74187	1.67	0.0966
SF3	0.000503	0.000353	1.42	0.1574
Nstand	11.23947	3.33912	3.37	0.001
ROGT	-0.20307	0.11379	-1.78	0.0769
MOGT	-0.17572	0.12202	-1.44	0.1525
WOGT	-0.09542	0.11982	-0.8	0.4274
SSOGT	-0.30285	0.10448	-2.9	0.0045
SCOGT	0.21811	0.1235	1.77	0.08
R11	0.37363	0.1923	1.94	0.0544
M11	0.01108	0.15729	0.07	0.944
W11	-0.10675	0.20865	-0.51	0.6099
SS11	-0.08438	0.15155	-0.56	0.5787
SC11	-0.33699	0.17151	-1.96	0.0518
Attend	-0.00239	0.32644	-0.01	0.9942
Perform	0.93493	0.33136	2.82	0.0056
RAYP	0.67165	1.90915	0.35	0.7256
MAYP	-2.01609	1.29451	-1.56	0.122
OAYP	1.66439	2.19799	0.76	0.4504

Figure 1


MICHIGAN
CANADA
Toledo-Fremont
Cleveland-Akron-Elyria
CLEVELAND-ELYRIA-MENTOR
Ashtabula
ASHTABULA
LAKE
GEAUGA
CUYAHOGA
YOUNGSTOWN-WARREN-BOARDMAN (PART)
TRUMBULL
3
MERCER (PART)
WILLIAMS
FULTON
LUCAS
OTTAWA
ERIE
SANDUSKY
LORAIN
MEDINA
SUMMIT
AKRON
PORTAGE
MAHONING
PENNSYLVANIA
Defiance
DEFIANCE
HENRY
TOLEDO
WOOD
Fremont
SANDUSKY
Norwalk
HURON
PAULDING
PUTNAM
Findlay
HANCOCK
1
Tiffin
SENECA
Lima-Van Wert-Wapakoneta
Van Wert
VAN WERT
LIMA
ALLEN
WYANDOT
Bucyrus
CRAWFORD
MANS-FIELD
RICHLAND
2
Ash-land
ASHLAND
Wooster
WAYNE
CANTON-MASSILLON
STARK
East Liverpool-Salem
COLUMBIANA
HARDIN
Celina
MERCER
Wapakoneta
AUGLAIZE
Marion
MARION
MORROW
HOLMES
TUSCARAWAS
CARROLL
JEFFERSON
HANCOCK
BROOKE
INDIANA
Sidney
SHELBY
Bellefontaine
LOGAN
UNION
DELAWARE
Mount Vernon
KNOX
Coshocton
COSHOCTON
New Philadelphia-Dover
HARRISON
4
Green-ville
DARKE
MIAMI
Urbana
CHAMPAIGN
Columbus-Marion-Chillicothe
COLUMBUS
LICKING
Zanesville
MUSKINGUM
Cambridge
GUERNSEY
WHEELING
BELMONT
OHIO
MARSHALL
Dayton-Springfield-Greenville
SPRINGFIELD
CLARK
MADISON
FRANKLIN
FAIRFIELD
PERRY
MORGAN
NOBLE
MONROE
PREBLE
DAYTON
MONTGOMERY
GREENE
PICKAWAY
Washing-ton
FAYETTE
HOCKING
WASHINGTON
WEST VIRGINIA
FRANKLIN
CINCINNATI-MIDDLETOWN
BUTLER
WARREN
Wilming-ton
CLINTON
Chillicothe
ROSS
Athens
ATHENS
PLEASANTS
PARKERSBURG-MARIETTA-VIENNA
WOOD
WIRT
DEARBORN
HAMILTON
HIGHLAND
VINTON
MEIGS
OHIO
BOONE
KENTON
CAMPBELL
CLERMONT
BROWN
PIKE
JACKSON
ADAMS
Portsmouth
SCIOTO
GALLIA
MASON
Point Pleasant
GALLATIN
GRANT
PENDLETON
BRACKEN
KENTUCKY
LAWRENCE
GREENUP
BOYD
CABELL
WAYNE
HUNTINGTON-ASHLAND
Cincinnati-Middletown-Wilmington
KEY
1 Findlay-Tiffin
2 Mansfield-Bucyrus
3 Youngstown-Warren-East Liverpool (Part)
4 WEIRTON-STEUBENVILLE
LEGEND
Dallas-Fort Worth
Combined Statistical Area
RICHMOND
Metropolitan Statistical Area
Concord
Micropolitan Statistical Area
CANADA
International
TEXAS
State
HARRIS
County
Shoreline
CBSA boundaries and names are as of November 2004. All other boundaries and names are as of January 1, 2002.
N
0 8 16 24 32 40 Kilometers
0 8 16 24 32 40 Miles
42°
41°
40°
39°
38°

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